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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/051,226	01/22/2002	Won-Kyu Lee	6192.0278.AA	7988

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EXAMINER

SHENG, TOM V

ART UNIT	PAPER NUMBER
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2673

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DATE MAILED: 04/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/051,226

Applicant(s)

LEE ET AL.

Examiner

Tom V Sheng

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-3 are rejected under 35 U.S.C. 102(e) as being anticipated by Song et al. (US Patent 6313889 B1).

As for claim 1, Song teaches a thin film transistor liquid crystal display (figure 18) of a line inversion type for block-driving data lines, comprising:

a data line comprising an extension part overlapping a portion of a pixel electrode (a connect portion 21 as a branch of a data line D extends to and being overlapped with a pixel electrode 10; column 15, lines 36-50) to substantially minimize a blocking effect (figure 19C, a disconnection at point a is repaired by routing through another path by shorting and cutting at other places with a specific short at point c between the pixel electrode and the connection portion; column 17, lines 40 to column 18, line 12),

wherein the pixel electrode is arranged at a boundary pixel (Song inherently teaches this structure on every pixel that corresponds to the case of one data line per driving-block).

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As for claim 2, Song's pixels read on claimed boundary pixels between an (IN)th data line and an (IN+1)th data line where N is 1.

As for claim 3, the connect portion 21 inherently has a width extending toward the pixel electrode.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Song et al.

As for claim 4, Song teaches that the extension part is one piece extended from the side of the data line. Song does not teach wherein the extension part is composed of multiple extension pieces. However, it would have been obvious for one of ordinary skill in the art at the time the invention was made to incorporate more than one piece as this would allow more possible shorting points to alleviate more potential disconnections on the data line.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Song as applied to claim 1 above, and further in view of Admitted Art.

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As for claim 5, Song does not teach that the area of the extension part is substantially equal to the area of overlap between the pixel electrode and the data arranged over a portion of the pixel electrode.

Admitted Art teaches that there is a common overlap between a pixel electrode and a data line for display contrast enhancing purpose.

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to incorporate Admitted Art's data line with common overlap into Song in order to further enhance display contrast. Further, having the extension and the common overlap have the same area does not provide any specific benefit.

6. Claims 6-12 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Song in view of Zhang et al. (US 6633359 B1).

As for claim 6, Song teaches a thin film transistor liquid crystal display (figures 3 and 18) of a line inversion type for block-driving data lines, comprising:

a substrate (figure 2, the TFT substrate on which a TFT and a pixel electrode 10 is formed);

thin film transistors formed in each pixel to form a matrix (figures 3 and 4), in which a gate electrode (gate electrode 2) crosses an active pattern formed on the substrate (as shown in figures 2 and 3) and is apart from the active pattern by a gate insulating layer (gate insulating layer 4);

a plurality of gate lines (gate line vertical portion G_{V2}) connected to gate

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electrodes of the thin film transistors of the same row in the matrix (as shown in figures 3 and 18; column 3, lines 26-27);

a plurality of data lines (data line D) electrically connected to drain regions (source electrode 7) of the thin film transistors of the same column in the matrix so as to apply a data signal to the thin film transistors (as shown in figures 3 and 18; please note that applicants call the connected electrode to data line a drain electrode while Song calls that a source electrode), the data lines being substantially parallel with one another to pass peripheral parts of the pixels (as shown, data line D passes through periphery between pixels PX1 and PX3 and between pixels PX2 and PX4);

and a plurality of pixel electrodes (pixel electrode 10) formed in the middle of the pixels (as shown) so as to be connected to a source region (drain electrode 8) of the thin film transistors,

wherein the TFT-LCD further comprises at least one of the plurality of data lines having an extension part (a connect portion 21 as a branch of a data line D extends to and being overlapped with a pixel electrode 10) overlapping at least one of the plurality of pixel electrodes of a boundary pixel (Song inherently teaches this structure on every pixel that corresponds to the case of one data line per driving-block) to substantially minimize a blocking effect (figure 19C, a disconnection at point a is repaired by routing through another path by shorting and cutting at other places with a specific short at point c between the pixel electrode and the connection portion; column 17, lines 40 to column 18, line 12).

Song does not teach of the pixel electrode having an area overlapping an adjacent data line passing around the respective pixels.

Zhang teaches providing a black matrix to each pixel by overlapping vertical gap area 26b with signal line 11a and overlapping horizontal gap area 26a with scan line 15. See figures 5a-c and column 8, lines 52-63. Song also teaches using a closed loop type of gate line for forming a black matrix. One of ordinary skill in the art would recognize the equal effect of the two methods.

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to incorporate Zhang's black matrix effect, in place of the closed loop black matrix, using data line that overlaps with adjacent pixel electrodes because the substrate area to be occupied by pixel electrodes can be broadened and the effective opening ratio of each pixel can be improved.

As for claim 7, Song's boundary pixels read on claimed boundary pixels between an $(IN)^{th}$ data line and an $(IN+1)^{th}$ data line in the case of N equals 1.

As for claim 8, Song teaches using indium tin oxide for the pixel electrode 10 (column 16, lines 28-31).

As for claim 9, Song teaches using a common electrode (CE) that forms a liquid crystal capacitance with the pixel electrode 10 of each pixel (column 2, lines 3-27). The common electrode reads on claimed storage electrode.

As for claim 10, inherently there must be an insulating layer between the pixel electrode and the data line or a short would form and result in failure as a LC display.

As for claim 11, indium tin oxide is a well-known transparent conductive material.

Claim 12 is regarding a liquid crystal display and reads on claim 6's limitations except wherein the plurality of data lines comprises at least one data line arranged over a pixel electrode to substantially minimize a blocking effect. Further, one of ordinary skill in the art would recognize that the key to minimizing a block effect of Song is to provide an sufficient area of the data line over the pixel electrode, thus it does not matter whether the area of overlap is an extension portion or a common overlap from the data line.

As for claim 15, it is not patentively distinct whether the extension comprises one extension piece or two extension pieces and how they are connected. It is the area of overlap that is the matter of the invention.

7. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Song and Zhang as applied to claim 12 above, and further in view of Knapp et al. (US 6700562 B1).

As for claims 13 and 14, Song or Zhang does not teach wherein the plurality of pixel electrodes comprises a transparent conductive material or a reflective conductive material. Knapp teaches in active matrix liquid crystal display that for a transmissive display, the display element electrodes are formed of a light transparent conductive material such as ITO, and for a reflective display, the display element electrodes are formed of a light reflecting conductive material such as metal.

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to use a transparent conductive material for the pixel

electrodes of Song in a transmissive display and to use a light reflecting conductive material for the pixel electrodes of Song in a reflective display.

Response to Arguments

8. Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom V Sheng whose telephone number is (703) 305-6708. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (703) 305-4938. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tom Sheng
April 17, 2004


KENT CHANG
PRIMARY EXAMINER